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REPORT OF THE UNITED NATIONS EXPERT ON SPACE APPLICATIONS

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INTRODUCTION

1. At its thirty-first session, held in Vienna from 21 February to 4 March 1994, the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space (COPUOS) reviewed the activities of the United Nations Programme on Space Applications. The Subcommittee noted that the 1993 activities of the Programme had been carried out satisfactorily, and that the activities scheduled for 1994 had been endorsed by the General Assembly in its resolution 48/39 of 10 December 1993. The Subcommittee recommended to COPUOS, for its approval, the activities scheduled for 1994 under the regular budget, and took note of other activities of the Programme, all of which are to be implemented as part of the space-applications-related recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE 82), as proposed by the Expert on Space Applications in his annual report (A/AC.105/555) submitted to the Scientific and Technical Subcommittee at its 1994 session.

I. MANDATE OF THE PROGRAMME

2. The General Assembly, in its resolution 37/90 of 10 December 1982, took into account the recommendations of UNISPACE 82, and expanded the mandate of the Programme to include, in particular, the following elements: (a) provision of assistance in the development of indigenous capability at the local level; (b) provision of long-range fellowships for in-depth training; (c) provision of technical advisory services to Member States and regional institutions upon request; (d) organization of regional and international training courses, seminars, workshops, conferences and technical expert meetings for the benefit of specialists, educators, managers and decision makers in order to enhance their technical capabilities as well as keep them abreast of ongoing developments in the discipline; (e) acquisition and dissemination of space-related information; and (f) promotion of greater cooperation between developed and developing countries, as well as among developing countries. Presented below are summaries of the activities carried out in 1994, those scheduled for implementation in 1995 and those proposed for 1996.

A. Development of indigenous capability

3. The latest efforts of the Programme in assisting the developing countries in building up indigenous capabilities in space science and technology are being channelled towards the development and enhancement of knowledge and skills in the discipline by the establishment and operation of centres for space science and technology education at the regional level. A prerequisite to successful space technology applications is the building up of various essential indigenous capacities, particularly human resources, within each region. Specifically, if effective assimilation and appropriate application of space technology are to succeed in the developing countries, and particularly if such a discipline as remote sensing is to transcend its current image of being a technology-driven tool into a user-driven one, efforts must be devoted, at the local level, to the development of necessary high-level knowledge and expertise in space technology fields. In recognition of such a prerequisite, the General Assembly, in its resolution 45/72 of 11 December 1990, endorsed the recommendation of COPUOS that:

> "... the United Nations should lead, with the active support of its specialized agencies and other international organizations, an international effort to establish regional centres for space science and technology education in existing national/regional educational institutions in the developing countries" (A/AC.105/456, annex II, para. 4 (n)).

4. A progress report (A/AC.105/498) on the establishment of the centres was prepared in early 1992. An updated project document (A/AC.105/534) on the same subject was issued in January 1993. A new report on the latest status of the centres will be issued in late 1995.

5. The activities at each Centre will be undertaken in two major phases. Phase 1, will emphasize the development and enhancement of the knowledge and skills of university educators and research and application scientists in both the physical and natural sciences as well as in analytical disciplines. This will be accomplished through rigorous theory, research, applications and field exercises over a nine-month period as laid out in the curriculum of the education programme of each Centre. Phase 2 will focus on ensuring that the participants make use of the skills and knowledge gained in phase 1 in their pilot projects, which are to be conducted over a one-year period in their own countries. The activities and opportunities provided in the two phases should adequately equip the participants (educators, and research and applications scientists) to introduce relevant aspects of space science and technology into existing education curricula in their own countries, and to contribute significantly to development programmes in their own countries. Each of the centres for space science and technology education should also contribute to the sustainable development of natural resources (air, water, land); provide a crucial supplementary input for biodiversity conservation and other related environmental programmes; and improve the overall development of the national technological base, including that of the telecommunications industry.

6. Each Centre's initial programmes will focus on remote sensing and geographic information systems, satellite meteorology, satellite communications, geo-positioning systems and atmospheric sciences. Its Data Management Unit will be linked to existing and future relevant global databases. Each Centre will also foster continuing education programmes for its graduates, and awareness programmes for policy and decision makers and the general public in each region. A master curriculum is now being developed, internationally, for these centres. These centres should result in the development and growth of capacities that will enable each of the participating developing countries to enhance its knowledge, understanding and experience in those aspects of space science and technology that have the potential for a greater impact on its economic and social development including the preservation of its environment.

7. A step-by-step implementation of the programme of each Centre in education, research and applications as laid out in the two phases described above and in its academic curricula should have a multiplying effect and should result in the following:

(a) A capacity for each country to enhance its scientific and technical knowledge and experience particularly in those application areas (Earth observation and telecommunications) that have the potential for a greater impact on each country's economic and social development, including the preservation of its environment;

(b) A capacity to utilize data from Earth observation systems for weather prediction and monitoring of hurricanes and other natural phenomena so that appropriate disaster management and mitigation programmes can be undertaken;

(c) A capacity to strengthen institutions of higher education as well as national and regional institutions, and subsequently to enable each country to support research and development efforts in those national institutions, especially those dealing with the understanding and application of environmental information systems;

(d) A capacity for each country to enhance national and regional communication systems, including those associated with rural development, delivery of health services, disaster mitigation, air and maritime navigation, and to establish a network linking the region's professionals and scientists, government establishments and industries, in order to facilitate the exchange of ideas, data and experience;

(e) A capacity to develop appropriate environmental and atmospheric sciences curricula that can be easily taught and demonstrated at the high-school and university level in each country, and to effectively prepare educators to teach classes in those disciplines on their return to their institutions;

(f) A capacity to participate in regional and international environmental programmes such as the International Geosphere-Biosphere Programme and Mission to Planet Earth, and to contribute to the understanding and support of international actions on such issues as global warming and climate change, ozone layer depletion, global deforestation, land degradation and management of the coastal marine environment.

8. The first step in the establishment of the centres is the assessment, through evaluation missions, of the facilities and the resources that would support the programmes of the centres. The progress, to date, in establishing a centre at each regional level is described below.

Location of centres

9. Latin America and the Caribbean: On the basis of the report of the evaluation mission to Latin America and the Caribbean, the Office for Outer Space Affairs identified Brazil and Mexico as the most viable locations where two arms of the regional Centre for Space Science and Technology Education could be established. The Governments of Brazil and Mexico, with input from the United Nations, are finalizing the legal status and the conditions under which the regional Centre for Space Science and Technology Education for Latin America and the Caribbean will operate.

10. Asia and the Pacific: From 8 to 29 May 1994, an evaluation mission visited China, India, Malaysia, Pakistan, Sri Lanka and Thailand to assess and analyse the elements offered by these countries. These elements included the physical infrastructure (i.e. academic, research and living facilities), financial support, equipment available on a dedicated or shared basis, existing space technology-related education programmes and experience, the degree to which the proposed concept of a centre could be fulfilled, governmental and institutional support, existing/planned communications systems, administrative and academic autonomy offered to the Centre, local expertise and experience available to the Centre.

11. The Office for Outer Space Affairs analysed the final report of the Evaluation Mission to these six countries. Beginning as a single node in India, the Centre for Space Science and Technology Education in Asia and the Pacific should subsequently grow as a network institution with major nodes to cover specific programme elements in established space-technology related institutions in the region. The Centre should allow for its growth to countries with established and potential capabilities, as well as to countries which already have or might develop viable programmes in selected areas of space science and technology. The complete text of the Statement of the Office for Outer Space Affairs on the establishment and location of the Centre in Asia and the Pacific is shown in annex I.

12. An evaluation mission to the Islamic Republic of Iran was conducted in August 1993. The results of the mission have been forwarded to the Government of the Islamic Republic of Iran for its attention and necessary follow-up action. Negotiations are continuing with the Government on the establishment of this Centre.

13. Africa: Evaluation missions to Africa (Ghana, Kenya, Morocco, Nigeria, Senegal and Zimbabwe) were conducted in 1993. All the Governments concerned have offered their comments on the reports of the missions. An analysis of the mission reports by a group of experts is now in progress.

14. Western Asia: The evaluation mission to Egypt, Jordan and the Syrian Arab Republic was conducted from 16 to 26 March 1994. Negotiations are in progress with concerned parties on the establishment of this Centre.

15. The centres in (a) Asia and the Pacific, and (b) Latin America and the Caribbean will be inaugurated in 1995. In each case, the Governing Board will be the principal policy-making organ of each Centre.

B. Long-term fellowship programmes for in-depth training

16. The Programme received 19 long-term fellowship offers for the 1993-1994 period from the Governments of Brazil (10) and China (4), as well as from the European Space Agency (ESA) (5). For the 1994-1995 period, the Programme received 17 long-term fellowship offers from the Governments of Brazil (10) and China (2) and ESA (5). The status of the 1994-1995 awards is reflected in annex II of the present report. The fellowship awards cover monthly allowances for room and board, books, local travel and health benefits. The offers are described below in further detail.

17. The 10 long-term fellowships offered by the Government of Brazil are for research and applications in remote sensing technology and are tenable at the Instituto Nacional de Pesquisas Espaciais (iNPE), Sao José dos Campos, Brazil. The ninth set of participants in this fellowship series were selected from the region of the Economic and Social Commission for Latin America and the Caribbean (ECLAC) and commenced their studies in April 1994; these studies were completed at INPE on 4 November 1994. The next set of participants will commence their studies in April 1995.

18. The two fellowships offered by the Government of China, each for a period of one year, are for research and training in geodesy, photogrammetry and remote sensing. These fellowships are tenable at the Wuhan Technical University of Surveying and Mapping, Wuhan, China, and the 1994/95 participants began their studies in October 1994.

19. The five ESA long-term fellowships are each for a period of one year of research and study at ESA institutions and in the disciplines described below:

(a) Space antennas and propagation (1): European Space Research and Technology Centre, Noordwijk, the Netherlands;

(b) Communications systems (1): European Space Research and Technology Centre, Noordwijk, the Netherlands;

(c) Remote sensing information systems (2): European Space Research Institute, Frascati, Italy;

(d) Remote sensing instrumentation (1): European Space Research and Technology Centre, Noordwijk, the Netherlands.

20. The 1995/96 fellowship awards were advertised in December 1994. Selected candidates will begin their studies on 4 September 1995 at the above-mentioned institutions of ESA.

C. Technical advisory services

21. The United Nations Space Applications Programme is now entering an intensive and extensive phase of technical advisory service. The latter is fuelled by four factors:

(a) The developmental support needed by the centres for space science and technology education that are being established;

(b) Advances in Earth Observation Systems technology particularly in microwave remote sensing and the need to prepare Member States for this new phase of Earth observation;

(c) Follow-up projects that have resulted from different activities of the Programme;

(d) Increasing requests for the services of the Programme by national and regional entities.

22. The following are among the technical advisory services currently being rendered under the auspices of the Programme.

1. Republic of Korea: Asia-Pacific Satellite Communications Council

23. In 1992, the Government of the Republic of Korea hosted and co-sponsored the United Nations Workshop for Communications and Development at Seoul from 24 to 28 November. The main objectives of this Workshop were to exchange information on the status and future trends of satellite communications technology, to assess its contributions to economic and social development in this region, and to provide a forum that could enhance regional and international cooperation particularly in the fields of communications. One of the major outcomes of that Workshop was the endorsement of the initiative of the Republic of Korea to establish an Asia-Pacific Satellite Communications Council (APSCC) as a forum that could accomplish the objectives of that Workshop. In the view of the participants at that Workshop, such a Council is vital for the coordination and implementation of satellite communications programmes to meet the growing demands for such services in the Asia-Pacific region.

24. According to the 1992 Workshop participants, among the compelling reasons, which are peculiar to Asia and the Pacific, for establishing APSCC were the following:

(a) There is a rapid increase in the number of satellite communications users and in the number of countries that already own or are planning to acquire the space segment of a satellite communications system. An APSCC is needed to promote cooperation and harmonization in satellite communications development in the region;

(b) Many countries of the region are made up of islands that are scattered, particularly over the Pacific Ocean. Communications among and within these islands can only be effectively achieved through a satellite communications network. An APSCC is needed to promote the gaining of access to information by and of such island States, and to provide for better cooperation in the region;

(c) Because they are heavily dominated by terrestrial operators, existing communications-related institutions within the region do not consider space communications as their primary concern. According to the 1992 Workshop participants, such institutions have not manifested much interest in such important issues as education, health care and welfare (information on these issues are routinely transmitted today via satellites), and that these institutions/organizations are mostly interested in technical and business aspects of telecommunications. An APSCC is needed to bridge these gaps.

25. In 1992, an Ad Hoc Committee was established to draft the Constitution and associated by-laws and procedures of the Council. The Government of the Republic of Korea offered to host the APSCC secretariat as well as provide necessary funds for its operation. By 1 May 1993, 20 Asia-Pacific countries agreed with the views of the 1992 Workshop participants and communicated to the United Nations their approval of the establishment of the Asia-Pacific Satellite Communications Council. In a letter dated 1 March 1993, the Secretary-General of International Telecommunications Union (ITU) indicated that such a Council could be a useful vehicle for continuing exchange of information on proposals and plans for satellite communications in the region. He said that ITU would be pleased to cooperate in this initiative in appropriate ways.

26. The 1994 APSCC Workshop was held at Seoul from 26 to 29 October 1994 and co-sponsored by the Republic of Korea and the United Nations. At the Inauguration Meeting held on 25 October 1994, APSCC was formally inaugurated and its constitution adopted by consensus. All the officers of APSCC, including its President were also elected; and the offer of the Republic of Korea to host the secretariat of

APSCC was welcomed and accepted. The adopted constitution is being sent to all its member States and communication satellite operators in the region for endorsement. At the request of the 1992 Workshop, the United Nations Programme on Space Applications actively cooperated with the Ad Hoc Committee established at that time and assisted in the final establishment of APSCC. The 1994 APSCC Workshop was held under the theme "Towards a closer neighbourhood by satellite communications". It was attended by 228 satellite communications experts, government officials and private satellite operators from the Asia-Pacific region as well as from other regions.

27. The objectives of APSCC are as follows:

(a) To exchange views and ideas on technologies, systems, policies and services of satellite communications which are applicable to the betterment of the Asia-Pacific region;

(b) To promote and accelerate the efficient introduction of telecommunication services via satellites in the region;

(c) To assist in the development of national capabilities for establishing domestic and regional satellite communication services;

(d) To enhance the coordinated effort to formulate the recommendations of technical standards of satellite communications within the region.

Both the 1992 and 1994 Workshops were opened by the Minister of Communications of the Republic of Korea.

2. Ecuador: Cotopaxi ground receiving station

28. In 1993, the Programme on Space Applications concluded a mission to the Andean subregion in respect of the Cotopaxi ground receiving station (A/AC.105/555, paras. 23-27). On the basis of the mission report, the Corporación Andina de Fomento (CAF) approved a technical cooperation fund of US$200,000 to finance a feasibility study and other substantive actions necessary for the establishment of the Multi-National Enterprise within which the Cotopaxi station will operate. This feasibility study began in late 1994 and will be concluded in the first quarter of 1995. A decision on the results of this study will subsequently be taken by the Government of Ecuador and other members of the Andean group.

3. Chile: Follow-up to the Second Space Conference of the Americas

29. The Programme on Space Applications is providing support to and serving in the Technical Advisory Committee of the pro tempore secretariat created at the conclusion of the Second Space Conference of the Americas held at Santiago, Chile in 1993. In November/December 1994, the Programme served in a Technical Panel established by the pro tempore secretariat of the Conference to undertake a technical evaluation of the projects submitted by Governments and institutions of the region, in response to the recommendations of the Conference. The Panel screened, analysed, integrated and consolidated these project proposals on the basis of their technical merits and reformulated them in accordance with project submission formats of Governments and funding institutions.

4. Africa: Implementation of the recommendation of the Dakar Regional Conference

30. As a follow-up to the 1993 Regional Conference on Space Technology for Sustainable Development in Africa, which was held under the auspices of the Programme, the Office for Outer Space Affairs communicated the report of that Conference to all the entities concerned. The United Nations Development

Programme (UNDP) subsequently confirmed its willingness to cooperate with the United Nations Office for Outer Space Affairs in implementing one of the major recommendations of the Conference, i.e. to urgently establish an efficient communication network/linkage among African professionals and scientists at national, subregional/continental levels.

31. In December 1993, as an activity of the Programme, the United Nations Office for Outer Space Affairs submitted a project proposal that could address the above-mentioned recommendation of the Conference to the UNDP for its consideration and support. The Association of African Universities welcomed this initiative, which falls within its Core Programme and which will be among the perspectives to be addressed at its Colloquium in January 1995.

32. A successful funding campaign for this purpose will result in the participation of nine universities in nine African countries and three universities in three European countries in its activities and will enable them to benefit from the space segment already proposed for the Mercure project of the United Nations Environment Programme (UNEP), i.e. a transponder of INTELSAT VII. The minimum requirement for participation by each of these universities is an Earth station, with receive and transmit capabilities, and with a minimum throughput capacity of 19.2 kilobytes per second. Such a capacity would allow these stations to transmit and receive electronic mail and computer files from existing databases, and to communicate among themselves. Each participating African institution would also need to have an adequate workstation for the processing of the data it will gain access to.

33. If the above-mentioned project proves successful, similar pilot projects could be initiated in other developing countries of Asia and the Pacific, Latin America and the Caribbean as well as in Western Asia.

5. Frascati Training Course: Follow-up activities

34. In 1993, the United Nations, Office for Outer Space Affairs, Space Applications Programme and Department for Development Support and Management Services, and ESA jointly initiated, on request, a technical assistance programme that would strengthen the capability of a number of institutions in Africa and Latin America.

35. The United Nations/European Space Agency selected projects that are ongoing but are in need of assistance in the following specific areas, as follows:

(a) Satellite data that are required by the project concerned;

(b) Specialized on-the-job training, by making use of the satellite data provided to the project;

(c) Hardware components and/or software packages necessary to complete the processing configuration for the required data handling and manipulation;

(d) Tools to connect to an E-mail network for exchange of technical information and updating on results and problems;

(e) Thematic seminars as meeting opportunities for project experts to technically discuss specific results and/or problems associated with the project implementation;

(f) Technical assistance and documentation on the above areas.

36. Several application projects, though at different technical and maturity levels, have already been sent to the United Nations and ESA by the participants at the two previous United Nations/European Space

Agency training courses held at the European Space Research Institute (ESRIN) of ESA on the use of ERS-1 data. These first submissions from Latin America are now being used by the United Nations and ESA to formulate an integrated set of thematic regional programmes.

D. United Nations training courses, workshops, conferences and symposia

1. Activities carried out in 1994

37. In 1994, the United Nations conducted two training courses, five workshops and one symposium under the auspices of the Programme. A summary of each of these activities is presented below.

Frascati, Italy: United Nations/European Space Agency Training Course for Latin American and Caribbean Countries on Applications of the European Remote Sensing Satellite (ERS-1) Data for Natural Resources, Renewable Energy and the Environment

38. The United Nations/European Space Agency Training Course for Latin American and Caribbean Countries on Applications of the European Remote Sensing Satellite (ERS-1) Data for Natural Resources, Renewable Energy and the Environment was organized by the Programme on Space Applications and by the Department for Development Support and Management Services in cooperation with ESA. It was held from 18 to 28 April 1994 at ESRIN at Frascati, Italy. The final session and closing ceremony of the Course were held at the Headquarters of the Istituto Italiano-Latino Americano at Rome on 29 April 1994.

39. The objectives of the Course were (a) to provide participants from Latin American countries with a theoretical basis and practical experience in various aspects of microwave remote sensing, focusing on the applications of that technology to natural resources, sources of renewable energy and, in particular, its use in conducting inventories and monitoring the environment; and (b) to familiarize the participants with the bibliography and archive of ERS-1 materials and data that are available at the ESRIN facility at Frascati.

40. The Course was attended by 24 participants from the following countries: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela. Financial support to defray the cost of air travel and living expenses of the participants was provided by the United Nations Trust Fund for New and Renewable Sources of Energy. The programme for the Course was developed jointly by ESA and the United Nations (Office for Outer Space Affairs). The lecturers for the course came from France, Spain, ESA and the United Nations.

41. The Course provided participants with the physical theory on which remote sensing, both active and passive, is based. The Course presented an overall view of remote sensing in various intervals of the electromagnetic spectrum, including the visible, infrared and microwave regions of the spectrum. Regarding microwave remote sensing, the Course included the theory and concepts of Synthetic Aperture Radar image formation as well as an introduction to digital image processing of radar data in agricultural, oceanographic, geologic, topographic and cartographic applications. The Course also provided the participants with examples of the applications of the data received from various instruments on board ERS-1 as well as with hands-on experience in digital processing of its images. The presentations made by the lecturers, and a number of participants, included case-studies of programmes or projects conducted in Africa.

42. Opportunities were provided for the participants to make short presentations on the research or operational work that they were conducting at their home institutions. During discussion periods regarding their work and experiences, the participants indicated that two obstacles to their utilization of images such as those that they were learning to use at the course were the lack of access to them and a need for further education on the principles of their use and hands-on training to develop experience in the mechanics of their

analysis. The representatives of the United Nations and ESA indicated that they were exploring ways and means by which at least a limited amount of data and further training could be provided for use in their ongoing activities. The report on the Course is contained in document A/AC.105/594.

Stockholm and Kiruna, Sweden: Fourth United Nations Training Course on Remote Sensing Education for Educators

43. The Fourth United Nations Training Course on Remote Sensing Education for Educators was organized in cooperation with the Government of Sweden through the Swedish Board for Investment and Technical Support (BITS) and was hosted by the Department of Physical Geography, Stockholm University, and the Swedish Space Corporation (SSC Satellitbild), Kiruna, for the benefit of developing countries. It was held at Stockholm and Kiruna from 2 May to 10 June 1994.

44. The main objectives of the Course were to provide participants with educational and practical knowledge on current and future remote sensing systems, including the acquisition, processing, interpretation, application and archiving of the data generated by such systems, to demonstrate different satellite remote sensing methods, to expose the participants to various aspects of application of satellite data, including data and materials from the participants' own countries, in project planning and management, as well as to equip them with the ability to introduce elements of the technology and its applications, as appropriate, in the educational curricula in their universities and institutes. The programme of the Course was designed jointly by the Office for Outer Space Affairs, Stockholm University and SSC Satellitbild.

45. The Government of Sweden, through the University of Stockholm, SSC Satellitbild and BITS, coordinated local arrangements and provided technical equipment, materials, course facilities, local transportation and the course instructors. Funds allocated by the United Nations were used to defray the costs of international air travel for 11 participants. On behalf of the Government of Sweden, BITS provided room and board, local transportation and an allowance for incidental expenses for all the participants as well as international air travel for 16 participants.

46. Participants at the Course totalled 27 educators; they came from Bangladesh, Colombia, Costa Rica, Guyana, Jamaica, Jordan, Kenya, Morocco, Namibia, Nepal, Nigeria, Pakistan, Palestine, Panama, Peru, Sri Lanka, Swaziland, United Republic of Tanzania, Tunisia, Uganda, Uruguay, Viet Nam, Yemen and Zimbabwe. In addition to the Swedish instructors, experts from Germany, Norway and ESA provided instructions at the Course. The report on the Course is contained in document A/AC.105/581.

Cairo, Egypt: Fourth United Nations/European Space Agency Workshop on Basic Space Science

47. The Fourth United Nations/European Space Agency Workshop on Basic Space Science was hosted by the Government of Egypt and held at Cairo, Egypt, from 27 June to 1 July 1994. The Workshop was co-sponsored and co-organized by ESA, The Planetary Society (TPS) and the United Nations.

48. Because the scientific, economic and social progress of any country are strongly interrelated, and because basic space science, including physical and mathematical sciences, plays an important role in providing solutions to problems of development in general, this Workshop was organized to call the attention to the fact that the pursuit of basic space science is critical to the future economic prosperity of all countries. The Workshop focused on: (a) creating and improving awareness among scientists of current and future scientific and technical aspects of basic space science; (b) enhancing national capabilities that could be used to develop programmes and to undertake research activities in basic space science; (c) enhancing scientific cooperation internationally and, in particular, among developing countries; (d) addressing the question of effectively integrating basic space science into the programmes of the planned centres for space science and technology education; and (e) exploring avenues of education, training and research on subjects in basic space science.

Workshop sessions included topics related to planetary science, the Sun, ground-based and space-based astronomical observatories, and space astronomy and astrophysics.

49. The Workshop was attended by 95 scientists from 22 countries: Austria, Bahrain, Canada, China, Colombia, Costa Rica, Egypt, Germany, Honduras, India, Japan, Kenya, Mauritius, Mozambique, New Zealand, Nigeria, Oman, South Africa, Spain, United States of America, Zaire and Zambia; and the following 7 national and international organizations: Austrian Space Agency, ESA, German Space Agency (DARA), International Centre for Theoretical Physics, National and Aeronautics and Space Administration (NASA) of the United States of America, TPS and the United Nations. Funds allocated by these organizations were used to cover the cost of international air travel and daily subsistence allowance for 28 participants from 15 countries. The Government of Egypt provided the Workshop facilities and local transportation for the duration of the Workshop, and room and board for a number of participants. The report of the Workshop is contained in document A/AC.105/555.

Beijing, China: United Nations/China/European Space Agency Workshop on Microwave Remote Sensing Applications

50. The United Nations/China/European Space Agency Workshop on Microwave Remote Sensing Applications was organized in cooperation with the Government of China and hosted by the State Science and Technology Commission of China (SSTCC) and its National Remote Sensing Centre, from 14 to 18 September 1994, for the benefit of participants particularly from Asia and the Pacific.

51. The objective of the Workshop was to expose the participants to various aspects of current and future microwave remote sensing systems and applications of radar data to natural resources exploration and environmental monitoring. The experiences and programmes of a number of countries, including those particularly from Asia and the Pacific, in the development and applications of microwave remote sensing, were featured. The Workshop concluded with working group deliberations that focused on three major areas related to (a) data availability and accessibility; (b) practical applications of radar data; and (c) required education and training. The observations and recommendations of these working groups are contained in the report of the Workshop.

52. The participants were professionals with several years of experience in remote sensing or in developing plans for the management of natural resources and related programmes that can benefit from the applications of microwave remote sensing. The Workshop was attended by 85 participants from the following countries/territories and international organizations: Bangladesh, Cambodia, Canada, China, Germany, Hong Kong, India, Indonesia, Japan, Malaysia, Myanmar, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand, United Kingdom of Great Britain and Northern Ireland, United States; ESA, United Nations (Office for Outer Space Affairs) and UNDP (Beijing Office). Funds allocated by the United Nations and ESA for the organization of the Workshop were used to defray the cost of international air travel and daily subsistence allowance of 16 participants. The Government of China, through SSTCC, provided room and board for these same participants, as well as conference facilities and local transportation for all participants. A detailed report on the Workshop is contained in document A/AC.105/588.

Lima, Peru: United Nations/European Space Agency Workshop on Global Change and the Training Course on Microwave Remote Sensing Applications

53. The United Nations/European Space Agency Workshop on Global Change and the Training Course on Microwave Remote Sensing Applications were organized in cooperation with the Government of Peru for the benefit of participants from the ECLAC region. These activities were co-sponsored by ESA and by the

Comisión Nacional de Investigación y Desarrollo Aeroespacial (CONIDA) and were held consecutively from 3 to 4 and from 5 to 14 October 1994, respectively, at the Headquarters of CONIDA in Lima.

54. The objectives of the Workshop were (a) to familiarize participants with the scope of Global Change and with the location, contents and conditions of access to its archives in the region and internationally and (b) to discuss ways which would enable them to contribute to the data collection efforts as well as to utilize data from the archives being integrated in the Latin American and Caribbean region. Through presentations at the Workshop, the participants became aware that the International Geosphere-Biosphere Programme, also known as Global Change, aims at understanding the Earth as a complete system, in particular the interactions between land, ocean and atmosphere and the effects that changes in any of the biophysical or geophysical parameters ca . have on the system. Through round-table discussions, the participants and instructors identified international cooperative activities, including some in Latin America and the Caribbean, that are being conducted to establish worldwide archives of data from satellite and land-based sources.

55. The Course provided participants with education on the physical basis for radar (microwave) remote sensing as well as opportunities for hands-on training in specific applications of radar data. In particular, the participants became familiar with a new generation of sensor systems, specifically the radar satellites, which have the capability of gathering Earth observation data through cloud cover making them the best source of data over the tropical regions. Through theoretical and practical exercises, the participants acquired knowledge regarding the information that can be derived from these data and how this information can contribute significantly to the knowledge of the natural resources of a country and assist in the formulation of sustainable development and management policies.

56. Funds provided by the United Nations and ESA were used to defray the costs of air travel as well as a daily subsistence allowance for 21 participants and instructors in the Workshop and Training Course. The Workshop and Training Course were attended by 24 participants from the following countries: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Panama, Peru, Uruguay and Venezuela. The instructors for the Workshop and the Course came from Argentina, Brazil, Canada and Costa Rica; and from ESA and the United Nations (Office for Outer Space Affairs). A detailed report on the Workshop and Course is contained in document A/AC.105/596.

Graz, Austria: Enhancing Social, Economic and Environmental Security through Space Technology

57. The United Nations and the Government of Austria jointly organized a Workshop on "Enhancing Social, Economic and Environmental Security through Space Technology". This Workshop was held from 12 to 15 September 1994 at Graz and was hosted by the Austrian Federal Ministry for Foreign Affairs, co-sponsored by the state of Styria, the City of Graz and ESA.

58. The objective of the Workshop was to show that space technology can be a powerful tool for accelerating national development and that it provides a way of overcoming obsolete technologies and an alternative to percolation and trickle-down models of national development. Participants in this Workshop were expected to apply the experience gained at the Workshop to projects and report to appropriate authorities in their home countries.

59. Presentations focused on the applications of space technology for improving life on Earth while protecting the environment. The theme of the meeting built upon the Agenda 21[1] of the United Nations Conference on the Environment and Development (UNCED), held at Rio de Janeiro in June 1992, and its recommendations for sustainable development. Through technical presentations and working group discussions, the Workshop participants addressed the issues of how best to safeguard the environment and to ensure the efficient management and sustainable development of natural resources.

60. The participants were senior technical personnel in decision-making positions who were actively engaged in projects dealing with satellite communications or Earth observations. The following Member States and international organizations were represented at the Workshop: Argentina, Bangladesh, Bhutan, Brazil, Cameroon, Cape Verde, Cambodia, China, Costa Rica, India, Indonesia, Iran (Islamic Republic of), Mongolia, Pakistan, Republic of Korea, Senegal, Sri Lanka, Syrian Arab Republic, Tunisia, Uganda, Uruguay; ESA, International Mobile Satellite Organization (Inmarsat) and the United Nations Office for Outer Space Affairs. Contributors to the deliberations of the Workshop from Austria, France, Germany, Italy, Netherlands, Russian Federation, United Kingdom and the United States also participated. The report on the Workshop is contained in document A/AC.105/586.

Jerusalem, Israel: Benefits of Space Technology for the Developing World - from Economic Growth to Environmental Protection

61. The Symposium on "Benefits of Space Technology for the Developing World - from Economic Growth to Environmental Protection" was the fourth in a series organized by the United Nations and the International Astronautical Federation (IAF) and was held in conjunction with the 45th IAF Congress in Jerusalem. ESA and the Commission of the European Communities (CEC) co-sponsored the Symposium, which was hosted by the Israeli National Committee on Space Research (NRSC), on behalf of the Government of Israel.

62. The objective of the Symposium was to present well-established models of space applications and to develop, through working group discussions, general principles on how developing countries can successfully use space technologies, including remote sensing and space communications systems, for environmental protection and for economic and social development.

63. The programme of the Symposium was designed to provide the participants, through plenary presentations, with knowledge about the various efforts that were being undertaken at the national and international levels to provide access for the developing countries to new technologies. The main emphasis of the presentations was to highlight general principles on how developing countries could successfully use space technologies, including remote sensing and space communication systems, for environmental protection and for economic and social development.

64. The following Member Sates and intergovernmental and international organizations were represented at the Symposium: Brazil, Cameroon, China, Costa Rica, Egypt, India, Mexico, Philippines, Republic of Korea, Senegal, Thailand, Uruguay; ESA, CEC, IAF, Inmarsat, ITU and United Nations Office for Outer Space Affairs. Participants also came from Austria, Canada, Czech Republic, France, Ireland, Israel, Netherlands, Spain, United Kingdom and United States also attended. The report of the Symposium is contained in document A/AC.105/589.

2. Activities scheduled for implementation in 1995

65. The training courses, workshops, and symposia scheduled for 1995 are shown in annex III.

3. Activities proposed for implementation in 1996

66. The following training courses and conferences are proposed for 1996:

(a) Sixth United Nations/Sweden International Training Course on Remote Sensing Education for Educators;

(b) Second United Nations Regional Conference on Space Technology for Sustainable Development in Africa;

(c) Sixth United Nations/European Space Agency Workshop on Basic Space Science;

(d) Second United Nations Workshop on Spin-off Benefits of Space Exploration;

(e) United Nations/European Space Agency International Microwave Remote Sensing Training Course;

(f) Second Workshop on Payloads on Small Satellites;

(g) United Nations International Training Course on Communications Technology for Development;

(h) United Nations Workshop on Radar Remote Sensing Applications.

67. The actual implementation of the above-mentioned activities may be affected by the decision of the General Assembly on the organization of a third United Nations Conference on the Exploration and Peaceful Uses of Outer Space. The decision of the Assembly on such a conference may also have an impact on an International Youth Forum on Space Technology and our Future, which is being planned for the 1996-1997 period.

E. Space information

68. The directory on Education, Training, Research and Fellowship Opportunities in Space Science and Technology and its Applications was updated and reissued in 1993 as document A/AC.105/548. The 1995 edition of Seminars of the United Nations Programme on Space Applications, the sixth in the series of selected papers from the activities of the Programme, was issued as document A/AC.105/584.

F. Promotion of greater cooperation in space science and technology

69. Most of the activities covered in the present report have clearly advanced regional cooperation in space science and technology. Those noted below are noteworthy.

70. The association of the Programme with Secretariat units and specialized agencies of the United Nations, particularly UNEP, the United Nations Educational, Scientific and Cultural Organization (UNESCO), Food and Agriculture Organization of the United Nations (FAO), ITU and World Meteorological Organization (WMO), as well as with intergovernmental organizations, such as ESA, INTELSAT and Inmarsat, and with a number of non-governmental organizations, such as the Committee on Space Research of the International Council of Scientific Unions, IAF, International Society for Photogrammetry and Remote Sensing (ISPRS) and TPS, is advancing cooperation between developed and developing countries, as well as among the developing countries.

71. The efforts of the Programme to establish the centres for space science and technology education will also reinforce regional cooperation, particularly among developing countries, and between developed and developing countries.

II. VOLUNTARY CONTRIBUTIONS

72. The successful implementation of the 1994 activities of the Programme benefited from the support and voluntary contributions of States Members of the United Nations and their institutions, as well as from the assistance and cooperation of regional and international governmental and non-governmental organizations.

In 1994, the Programme received voluntary contributions, both in money and in kind, including the sponsorship of technical and scientific presentations by several experts, as detailed below:

(a) A number of Member States (Australia, Austria, Brazil, Canada, China, Egypt, France, Germany, Italy, Japan, Pakistan, Peru, Republic of Korea, Singapore, Spain, Sweden, United Kingdom, United States) provided support for the activities of the Programme in 1994 in various ways, including the following:

(i) Defrayal of the local expenses of candidates from developing countries in the long-term fellowship programmes (see paras. 16-20 and annex II);

(ii) Voluntary cash contributions were received in 1994 from the Governments of Austria (US$20,000) and Pakistan (US$10,000) in support of the activities of the Programme and from the United States (US$30,000) in support of the 1995 Workshop on Spin-off Benefits of Space Technology;

(iii) Co-sponsorship of the activities of the Programme and, in particular, the defrayal of the costs of participants' international air travel, local organization and facilities, room and board, and local transportation (see paras. 38-64);

(iv) Sponsorship (travel and daily subsistence allowance) of experts from Member States to provide technical presentations and to take part in deliberations of the activities of the Programme (see paras. 40, 46, 49, 52, 56, 59 and 63);

(v) Funding of experts (Australia and France) to participate in the evaluation mission to six Asia and Pacific countries in order to provide an accurate and informative report that could assist in the establishment of the centre for space science and technology education in that region;

(b) ESA support took the following forms:

(i) Defrayal of the local expenses of candidates from developing countries in its long-term fellowship programmes (see paras. 19-20 and annex II);

(ii) A financial contribution of US$95,000 in support of the workshops, training courses and conferences held at Cairo, Beijing, Jerusalem and Lima.

III. FINANCIAL PROVISIONS AND ADMINISTRATION OF 1995 ACTIVITIES

73. The 1995 activities of the Programme presented in this report will be implemented as follows:

(a) Financial provisions: Under the United Nations regular budget, a sum of US$443,000 was approved by the General Assembly at its forty-seventh session for implementing the activities of the Programme during the 1994-1995 biennium. In order to effectively carry out the mandated and expanded activities of the Programme, it has become necessary for the Programme to solicit additional funds, in the form of voluntary contributions, in support of its activities. These contributions will be used to supplement the regular budget of the Programme;

(b) Administration by and contributions and participation of staff: The Office for Outer Space Affairs, and in particular the Expert on Space Applications and his staff, will carry out the activities described in the present report. In this connection, travel will be undertaken as appropriate by the Expert and his staff under

the provisions of the biennium travel budget of the Office as approved by the General Assembly at its forty-ninth session and as may be necessary from voluntary contributions;

(c) Consultations, instructors, speakers and technical materials: Up to 50 specialists (necessitated, in particular, by the preparatory work associated with the establishment and operation of the regional centres for space science and technology education) in space science and technology and its applications will be required to serve as instructors, speakers and consultants during the implementation of the 1995 activities of the Programme. Expenses incurred in respect of the travel and per diem of these specialists and for necessary technical materials will be met partly from the regular budget and partly from voluntary contributions received from Member States and international organizations.

IV. SUMMARY OF STATISTICS ON SELECTED ACTIVITIES OF THE UNITED NATIONS PROGRAMME ON SPACE APPLICATIONS FOR THE PERIOD 1983-1991

74. At the start of each activity of the United Nations Programme on Space Applications, the representatives of the Office for Outer Space Affairs, as a matter of practice, usually urge participants to communicate regularly with the Office as well as with the co-sponsors of each activity, in order to assess the effectiveness of each activity and subsequently improve the programme of the activity concerned. In particular, the United Nations and co-sponsors of the activities of the Programme are interested in the impact of the activity on the performance and productivity of the participant in his or her country. To this end, a survey of those who participated in the activities of the Programme in the period 1983-1991 was carried out. The results of the analysis of the information received as feedback from the participants are presented below.

75. In the period 1983-1991, the activities of the Programme included 13 workshops, 5 seminars, 21 training courses and 9 expert meetings covering topics in the field of space science and technology.

76. A total of 461 participants, out of 1,203 that took part in the activities, responded to the questionnaire. The professional activities of the 461 participants are diverse, covering various fields in remote sensing (mapping, agriculture, forestry, hydrology, geology, mineralogy, fisheries), environmental science and applications (climate and hydrological systems, bio-geochemistry and geophysics, ecosystem dynamics and bio-chemistry cycles, atmospheric chemistry, solid earth science) and basic space science (atmospheric research, planetary sciences, astronomy, cosmology).

77. Statistics on the number of participants who expressed the view that their involvement in the activities of the Programme had enabled them to initiate, establish or direct the different groups, facilities or activities in their different professional fields in their countries of origin are presented in the table below.

Summary of activities of participants in activities of the United Nations Programme on Space Applications (1983-1991)

Activity or facility	Initiation	Establishment	Direction involved
	(Number of participants)		
Study group	72	37	50
Coordination of user group	42	33	41
National committee	34	20	43
National programme	57	40	47
Regional and international cooperation	46	32	44
Data receiving station	29	14	25
Data analysis centre	37	28	41
Training facility	67	41	59
Total	384	245	350

The table shows quite significantly that an important number of the 461 participants surveyed were involved in both the establishment and management aspects of a variety of undertakings directly related to applications of space technology at some time after their participation in activities organized by the Space Applications Section. These aspects are considered critical in the long-term process of building indigenous capacity in space technologies which corresponds to the expanded mandate of the Programme.

Notes

[1]Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992 (United Nations publication, Sales No. E.93.I.8 and corrigenda), vol. I: Resolutions Adopted by the Conference, resolution 1, annex II.

Annex I

ESTABLISHMENT AND LOCATION OF THE REGIONAL CENTRE FOR SPACE SCIENCE AND TECHNOLOGY EDUCATION IN ASIA AND THE PACIFIC

Statement by the Office for Outer Space Affairs, United Nations

1. In response to the General Assembly's endorsement of the recommendation of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE 82) that the United Nations Programme on Space Applications should assist Member States in enhancing their indigenous capability at the local level, the Office for Outer Space Affairs developed a proposal for the establishment of Centres for Space Science and Technology Education in the developing countries. This proposal was presented to the Committee on the Peaceful Uses of Outer Space through its Scientific and Technical Subcommittee at their 1990 sessions. The objective of these centres is to enhance the capabilities of Member States in different areas of space science and technology, capabilities that can advance their social and economic development. Thus, each of the centres will pursue in-depth education, research and applications programmes with initial emphasis on remote sensing, satellite communications, satellite meteorology, geopositioning systems and atmospheric sciences.

2. On 11 December 1990, in its resolution 45/72, the General Assembly endorsed the Committee's recommendation that the United Nations should lead, with the active support of its specialized agencies and other international organizations, an international effort to establish regional centres for space science and technology education in existing national/regional educational institutions in the developing countries.

3. In May 1994, a United Nations evaluation mission visited the six countries which offered to host the Centre in Asia and the Pacific (China, India, Malaysia, Pakistan, Sri Lanka and Thailand). The mission reflected in its report a very high interest for hosting the Centre in each of the countries it visited as well as the universal belief that the Centre is very necessary for the development plans of the region. An analysis of the mission's report and of the proposals submitted by the six member States shows that the Centre could be established in five of the countries visited. The analysis also shows that these countries could be grouped into: (a) those where the existing infrastructure is not completely developed and where the presence of the Centre would serve to stimulate space-related technological development; and (b) those with a fully developed space technology capability in all areas and where the Centre could serve as a means of sharing the knowledge and experience of those countries with the rest of the region.

4. The concept of the Centre calls for it to offer the best possible education, research and applications experience to the participants in its programmes. Permanent and visiting staff from countries both within and outside the region would contribute to the attainment of these elements of the Centre programmes. However, in its first years, the Centre would need to draw substantively on the expertise and experience available at institutions in the host country. The countries with fully developed capabilities, both in the education process and in the development and use of space technology, would offer the Centre a stronger foundation and the greatest opportunity to accomplish the above-mentioned goals.

5. The Office for Outer Space Affairs organized an evaluation mission consisting of a team of experts who conducted a detailed analysis of the elements offered for the Centre by the six countries identified above (paragraph 3). These elements included the physical infrastructure (i.e. academic, research and living facilities), financial support, equipment available on a dedicated or shared basis, existing space technology-related education programmes and experience, the degree to which the proposed concept of the Centre could be fulfilled, governmental and institutional support, existing/planned communications systems, administrative and academic autonomy offered to the Centre local expertise and experience available to the Centre, and language (vis-à-vis the rest of the region).

6. The mission concluded that offers from most of the countries it visited were substantively and conceptually strong, with each offer having advantages in specific areas. In order to take advantage of the diversity of resources of all these countries, the Centre statutes should allow for full regional participation in its programmes. This would enable the Centre to manifest itself as a regional institution. After weighing the relative strengths and limitations of the offers to determine the best overall conditions that would enable the Centre to attain its objectives, it will be to the advantage of Asia and the Pacific that the Centre be established in one of the group of countries described in paragraph 3 (b) above, especially China or India. Such an arrangement (a) would enable the Centre to readily utilize existing capabilities, facilities and resources; and (b) would enhance the ability of the Centre to achieve successful results in a shorter-time period, thus building the confidence of the Centre in its ability to contribute to regional and international cooperation in space science and technology.

7. According to the report of the Evaluation Mission, the overall offers from both China and India in scientific, technical, institutional and governmental support are relatively similar. The advances and future directions of space science and technology in both countries would be major assets to the Centre as it advances to attain its objectives for the benefit of countries in Asia and the Pacific.

8. However, the offers and commitments made by India in its proposal to host the Centre favour an early establishment and operation of the Centre in Asia and the Pacific. Elements of these offers and commitments in India's proposal include (a) an end-to-end capability in space, ground and application segments (i.e. from theory, research, experiment, fieldwork, data application and packaging of results for decision-making in each specific discipline that matches the particular interest of each participant); (b) provision of all necessary financial and other resources for establishing, operating, and maintaining the Centre as envisaged by the United Nations; and (c) a commitment to work towards a full utilization of the appropriate capabilities and expertise in different countries of the region in order to ensure the effective operation of the Centre.

9. Beginning as a single node in India, the Centre for Space Science and Technology Education in Asia and the Pacific should subsequently grow as a network institution with major nodes to cover specific programme elements in established space-technology-related institutions in the region. The Centre should also allow for its growth to countries with established and potential capabilities, as well as to countries which already have or might develop viable programmes in selected areas of space science and technology.

10. Coordination of programmes of the Centre would be carried out by its Governing Board, which would be regional in composition. The Board would be the supreme decision-making body that determines and modifies the Centre's overall policy and adopts its academic programmes.

Annex II

LONG-RANGE FELLOWSHIPS OFFERED BY BRAZIL, CHINA AND THE EUROPEAN SPACE AGENCY WITHIN THE FRAMEWORK OF THE UNITED NATIONS PROGRAMME ON SPACE APPLICATIONS, 1994-1995

Period	Country or organization	Subject	Financial support by host country or organization	Fellowships offered	Candidates selected	Applications submitted	User countries (one or more candidates selected)
1994/95	Brazil	Research and applications in remote sensing	Subsistence allowance and medical and accident insurance	10	1994 1995 Nominations in progress	1994 1995 Nominations in progress	1994 1995
1994/95	China	Geodesy, photogrammetry and remote sensing	Subsistence allowance and medical insurance	2	2	14	Sierra Leone Sudan
1994/95	ESA	Space antennas and propagation	Subsistence allowance	1	1994 No award 1995 Nominations in progress	1994 No award 1995 Nominations in progress	1994 No award 1995 Nominations in progress
1994/95	ESA	Remote sensing information	Subsistence allowance	1994 1 1995 2	1994 3 each for six months 2 each for 1 month 1995 Nominations in progress	Participation by ESA's direct invitation 1995 Nominations in progress	1994 Malaysia Indonesia Philippines 1995 Nominations in progress
1994/95	ESA	Communications system	Subsistence allowance	1	1994 No award 1995 Nominations in progress	1994 No award 1995 Nominations in progress	1994 No award 1995 Nominations in progress
1994/95	ESA	Remote sensing instrumentation	Subsistence allowance	1	1994 No award 1995 Nominations in progress	1994 No award 1995 Nominations in progress	1994 No award 1995 Nominations in progress

Annex III

UNITED NATIONS PROGRAMME ON SPACE APPLICATIONS: 1995 SCHEDULE OF COURSES, WORKSHOPS AND SYMPOSIA

Activities	Date and place	Objective	Status
Workshop on the development of education curricula for the Centres for Space Science and Technology Education	27 February-3 March 1995, Granada, Spain	To develop model curricula on Earth observation and environmental monitoring (remote sensing and GIS,[2] satellite meteorology), satellite communications and geopositioning systems and atmospheric sciences for the Centres on Space Science and Technology Education	Announcement on the Workshop already issued
United Nations/ESA International Microwave Remote Sensing Training Course on Applications of ERS-1 (for Asia and the Pacific participants)	28 April-5 May 1995, Frascati, Italy	To expose participants to the practical use of satellite radar imagery and disseminate information on accessibility to the environmental and natural resources management data	Confirmed Course already advertised globally
Fifth United Nations/Sweden International Training Course on Remote Sensing Education for Educators	1 May-9 June 1995, Stockholm, Sweden	To develop the knowledge and skills of university educators in remote sensing technology. The Workshop will also equip the participants with an ability to introduce element of the technology, as appropriate, in the academic curricula of their own universities and institutes	Confirmed Announcement on Workshop already issued
United Nations/ESA Training Course on the Use of ERS-1 Data for Mapping and Inventory of Natural Resources in Africa (for French-speaking countries)	15-19 May 1995, Libreville, Gabon	To expose participants to the practical use of satellite radar imagery and disseminate information on accessibility to the environmental and natural resources management data	Confirmed
United Nations/ESA Workshop on the Applications of Space Techniques to Prevent and Combat Disasters (for African English-speaking countries)	22-26 May 1995, Harare, Zimbabwe	To consider the ways in which developing countries can use space techniques to combat natural disasters and address the development of databases and the GIS to monitor disaster-related activities	Confirmed Announcement on Workshop already issued
United Nations/Spain/ESA International Workshop on Small Satellite Missions	19-23 Sept. 1995, Madrid, Spain	To focus on payloads in small experimental satellites, with emphasis on types and logistics of design process and system development methods that are associated with these satellites	Confirmed
United Nations/USA International Workshop on Spin-off Benefits of Space Technology: Challenges and Opportunities	16-20 Oct. 1995, USA	To address the many new dimensions that are continuously being introduced into Earth-based processes and procedures, including the enhancement of the scientific and technical capabilities made possible by space exploration and the opportunities for developing countries to participate in such efforts	Confirmed

[2]Geographical Information System.

Activities	Date and place	Objective	Status
United Nations Regional Conference on Space Technology for Sustainable Development in Latin America and the Caribbean in cooperation with ESA	30 Oct.-3 Nov. 1995, Mexico City, Mexico, in conjunction with SELPER Conference, 23-27 October 1995	To address the many new dimensions that are continuously being introduced into Earth-based processes and procedures, including the enhancement of scientific and technical capabilities made possible by space exploration and the opportunities for developing countries to participate in such efforts	Confirmed
United Nations/ESA Workshop on Basic Space Science (atmospheric sciences) to be organized for the benefit of Member States in Asia and the Pacific region	6-10 November 1995, Karachi, Pakistan	To address substantive and practical issues in atmospheric sciences, with emphasis on how the interactions that are taking place in the near, middle and upper atmospheres affect human activities on Earth	Confirmed
United Nations Workshop on the Use of Space Techniques for Monitoring and Control of Desert Environment for ESCWA region[b]	20-24 Nov. 1995, Damascus, Syrian Arab Republic	To focus on strengthening regional and global monitoring networks linked to the development of national monitoring systems for the observation of desert pollution, land degradation and desertification	Confirmed
United Nations/Austria/ESA Workshop on Benefits of Space Technology	4-7 September 1995, Graz, Austria	To focus on present and future derivations of space technology and their possible implementation and the use in the developing world	Confirmed
United Nations/CEC/ESA Workshop on Space Technology for the Developing World	29 Sept.-1 Oct. 1995, Oslo, Norway	To present the established models of space applications with the aim of developing through working group discussions general principles on how developing countries can successfully use space technologies, including remote sensing and space communications systems for environmental protection and for economic and social development	Confirmed

[b]Economic and Social Commission for West Asia.